

United States Patent [19]

Ludwig et al.

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[54] CONTROLLED RELEASE FORMULATIONS
AND METHOD OF TREATMENT

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[58] Field of Search 128/260; 424/14-22

[56] References Cited

U.S. PATENT DOCUMENTS

| | | | |
|-----------|---------|----------------|---------|
| 3,056,724 | 10/1962 | Marston | 424/22 |
| 3,507,952 | 4/1970 | Rednick et al. | 424/22 |
| 3,535,419 | 10/1970 | Siegrist | 424/22 |
| 3,736,646 | 6/1973 | Schmitt et al. | 29/458 |
| 3,773,919 | 11/1973 | Boswell et al. | 424/22 |
| 3,844,285 | 10/1974 | Laby | 128/260 |

| | | | |
|-----------|---------|----------------|-----------|
| 3,887,699 | 6/1975 | Yolles | 424/19 |
| 3,972,999 | 8/1976 | Tsuk | 424/78 |
| 3,976,071 | 8/1976 | Sadek | 128/260 |
| 3,991,766 | 11/1976 | Schmitt et al. | 128/335.5 |
| 4,011,312 | 3/1977 | Reuter | 424/78 |
| 4,076,798 | 2/1978 | Casey et al. | 424/22 |
| 4,118,470 | 10/1978 | Casey et al. | 424/19 |
| 4,166,107 | 8/1979 | Miller et al. | 424/19 |
| 4,166,800 | 9/1979 | Fong | 252/316 |

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[57] ABSTRACT

Controlled release formulations useful in the prolonged treatment and control of microbial infections in animals are comprised of a microbial agent intimately dispersed throughout a copolymer derived from lactic acid and glycolic acid. A method for providing protection to animals for extended periods of time following a single administration is provided.

48 Claims, No Drawings